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FOREST INSECT LABORATORY,  
STANFORD UNIVERSITY CALIFORNIA.

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Insect Control  
Modoc.

October 27, 1921.

REPORT OF EXAMINATION

OF

FANDANGO, LASSEN, BUCK CREEK and DAVIS CREEK BASINS

MODOC NATIONAL FOREST

August 25-28, 1921.

I WESTERN PINE BEETLE IN YELLOW PINE: (Dendroctonus brevicomis)

The Fandango, Lassen and Buck Creek drainage basins were covered by a general reconnaissance and, as a check, one section was cruised and the infested trees marked. Section 4, T. 45 N., R. 15 E., M.D.M., was selected for the intensive cruising as this section had been previously cruised and marked by Mr. Ralph Hopping. Since the old loss was accurately accounted for, the present cruise gave a very good indication of the progress of the infestation.

In July 1919 Mr. Hopping cruised the above section, marking all of the infested trees. His figures show a recent loss on this section, probably covering a four year period, of 1,130,000 B.F. and a loss for the season of 1919, up to July 1, of 184,150 B.F.

In September 1920, Mr. Miller made a survey of the area and noted a considerable decline in the 1920 infestation, over that of 1919.

On August 27th, 1921, the present cruise was made and the trees marked, with the following results:

<u>YEAR</u>	<u>TREES KILLED</u>	<u>VOLUME B.F.</u> <u>KILLED</u>	<u>PERCENT KILLED</u> <u>OF TOTAL STAND</u>
Old Loss (about four year period), 1919,	(About 90)	1,130,000	8.9
1920,	19	238,760*	1.9
1921 (to date),	12	54,270	.4
		16,570	.1

\*Twenty trees killed in 1919 with 54,610 B.F. were marked in 1921. This loss developed after Mr. Hopping's marking in July and brings the total 1919 loss up to 238,760 B.F.

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" District Forester  
" Supervisor of Modoc

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The timber cruise of this section shows a total stand of 12,841,000 B.F. of merchantable yellow pine.

A strip cruise three miles in length and ten chains wide run from Fandango to Lassen Creek indicates an average of:

Trees killed, 1920,-----32 per section,  
Trees killed, 1921,----- 5 per section.

A spotting and estimate made of the Buck Creek watershed and the south slope of Fandango Creek showed an average of:

Trees killed, 1920,-----20 per section,  
Trees killed, 1921,----- 3 per section.

Of course, the trees attacked from now on during the Fall will very considerably increase the 1921 loss so that it is hard to predict whether the 1921 loss will be more or less than the 1920 infestation.

From general observations of the type of the present infestation it is believed by the writer that the 1921 loss will be slightly less than that of 1920.

## II MOUNTAIN PINE BEETLE IN YELLOW PINE:(*Dendroctonus monticolae*)

Thruout the North Warner Range there appears to be a very virulent epidemic of mountain pine beetle in yellow pine pole stands. This epidemic is confined for the most part to north and east slopes in old burns where the reproduction has become very dense; and in moist situations along streams where the trees are crowded together. Small patches of these infested poles were observed on north slopes from the State line as far south as Cedar Mountain; and many other localities have been reported by Forest officers. Two of the most conspicuous centers located on the north and east slope of Sugar Hill and the north slope along Davis Creek near the Plum Valley Ranger station were examined.

Sugar Hill Area: The Sugar Hill area which is situated on the north and east slope of Sugar Hill in parts of Sections 23, 24 and 25, T. 46 N., R. 14 E., M.D.M. is by far the most important center of this infestation. It was examined by the writer in company with Ranger Smith on August 26, 1921.

The stand is a very heavy one consisting of a few large trees and a heavy growth of young pine and fir poles, ranging in diameter from six to twenty-four inches, which have completely filled an old burn which swept this slope many years ago.

The infestation was first reported in 1917 and since that time the original center has gradually widened in every direction. Starting apparently on the lower edge of the old burn, the infestation has gradually moved up the slope until now it has



reached the top and west edges of the burn and is at present moving towards the eastern edge. The total area probably exceeds 320 acres, with approximately 100,000 killed poles.

On a strip taken through the middle of the old area, not a single living yellow pine could be found. An examination around the upper edge showed as large a number of freshly attacked green trees as there were sorrel trees killed by the previous generation, so that it is evident that there is no decline as yet in the strength of this epidemic. However, the infestation does not appear to develop the epidemic form on west and south slopes and since the yellow pine has practically all been killed on this north slope it is quite possible that the beetles will diminish in the next year or so on account of lack of suitable material to work on.

Davis Creek Area: This area is probably second in importance to the Sugar Hill area. Located in Sections 23, 24, 25 and 26, T. 45 N., R. 14 E., M.D.M., north and east of the Plum Valley Ranger Station it extends over a larger area than that on Sugar Hill, but is not so intensive in character. Here again it is confined to north and east slopes in an old burn and to situations that have been favorable to a dense growth of young trees. However, probably not over 75% of the yellow pine have been killed in any one place.

From the old centers near the streams the infestation has spread out and worked towards the tops of the ridges, and at the present time the 1920 killed trees appear as scattered patches of an acre or more on the upper slopes and along the streams with many healthy trees between.

However, it is evident that there has been no decided abatement in the 1920 infestation and it will probably continue until it has exhausted the supply of suitable trees.

It seems evident that this epidemic is made possible by a weakening of the trees through crowding in a situation primarily adapted to white fir. These north slopes are not yellow pine situations and the trees have become weakened thru too great competition with their white fir neighbors. Thus thru a survival of the fittest these slopes are rapidly being turned over to white fir, to which by nature they seem to be best adapted, thru the agency of the beetles.

### III DEFOLIATION OF WHITE FIR:

There has been a very heavy and extensive defoliation of white fir throughout the white fir stands on the Warner Range. Ranger Smith and the writer first noticed it as we ap-



proached the Sugar Hill area. The dead tips of the white fir gave a sickly yellow cast to the entire slope. This combined with the dead and dying yellow pines made it appear as tho the entire forest was either dead or about to die. Upon closer examination it was found to be the work of a moth. Some adult specimens caught in cobwebs on the trees were collected, and many of the empty pupal cells were also found. The caterpillars had killed nearly all of the new growth on every branchlet of every tree. It was impossible to find a twig that had not been fed upon. The old needles were not attacked to any extent. Considerable webbing and frass was noted, especially towards the tops of the trees, and at the tip of practically every branchlet, in the center of a few needles webbed together, could be found the empty pupal cases of the escaped moths. Considering the large acreage of white fir throughout these mountains, the emergence of moths must have been tremendous. Very few cases of parasitism were noted.

Besides the moth there had been considerable killing of needles by a minute needle miner. Many bored needles with exit holes and frass were found but no specimens were collected.

#### IV CONTROL ESTIMATES:

##### Western Pine Beetle.

The survey shows that the present infestation is in the endemic stage with a maximum annual loss of thirty-two trees per section and a probable average of about twenty trees killed per section throughout the yellow pine stand.

Control, if undertaken, would be with the idea of applying the maintenance system. However, this system is still in the experimental stage, and the Bureau of Entomology is not ready to recommend its application, over large areas. The approximate cost of applying control to the spring infestation of 1922 to the 32,000 acres of yellow pine in this area, would be \$1500, or a little less than five cents per acre.

##### Mountain Pine Beetle. Sugar Hill and Davis Creek Areas.

Acreage affected: Total acreage infested in five year period, 500 acres; acreage infested per year, 100 acres.

Estimated annual loss: On a basis of expentancy value as used by U.S.F.S. in computing fire damage to immature timber (District Five circular S-90 of 2-15-17): Assuming age of stand at 30 years; stand at maturity to be 20 M.B.F. per acre; and present stumpage value at \$3.00 per M.---Expectancy value \$3.73 per acre,-----\$373.00.



Cost of treating:

On basis of an annual loss of 20,000 poles, which could be treated at the rate of 20 poles per man per day, at a cost for labor, travel and subsistence of \$120.00 per month per man.

Required 8 man crew for 4 months, total cost,-----\$3,840.00.

It is evident from the above figures that justification of the control of the Mountain Pine Beetle would have to lie in the protection afforded to the surrounding timber, since the cost of one year's control operations would be in excess of the value of timber lost during a ten year period. However, judging from the fact that during the past five years they have confined their activity to north slopes and crowded yellow pine reproduction, it seems safe to assume that they do not constitute a menace to adjacent mature timber, and therefore the instituting of control operations cannot be recommended.

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